DIGITAL SOLUTIONS

SYNERGI™ WATER

Advancing smart water networks
System planning is an intense and complicated process. You need to be able to anticipate needs and apply operational changes over short- and long-term planning periods. Simulation aims at taking the guesswork out of system planning, and DNV GL prides itself on exceeding your simulation expectations by using our powerful steady-state and extended period modelling engine.

Synergi Water – our simulation software package for modelling and analysis of closed conduit networks of pipes, regulators, valves, pumps, reservoirs, tanks, wells and boreholes – lets you generate fast, accurate simulation results. Synergi Water is used by hundreds of utilities, oil and gas midstream companies and consulting engineering firms worldwide.

**Why Synergi Water?**

- Versatile modelling environment for comprehensive analyses
- Supports your operational and management goals, including energy usage, design cost and resource management
- Performs fast and accurate analyses on extremely large systems of over 100,000 elements
- Models complex control arrangements for pumps, valves and regulators in nearly any operational scenario
- Water quality modelling
- Optionally licensed features extend the capability to perform reliability analysis and import data from GIS, CIS and meter data management systems
- DNV GL offers a complete range of engineering and IT consulting services, based on more than 40 years of experience in the water industry

Engineers need answers to complex questions during pipe network analysis. Synergi Water provides the answers, performing all the critical tasks needed to operate distribution and transmission water and fluid systems such as fire flow, water quality, facility design and pump/cost analysis. Synergi Water gives you knowledge, so you can be confident in your ability to predict how your entire network will behave under a variety of operating conditions.

Synergi Water is highly flexible, letting you choose the detail level for your models – from a simple hydraulic analysis of a single pressure zone to propagation of water quality in a multi-zone system. You have a straightforward and intuitive, yet comprehensive modelling interface at your command.

**Synergi Water tools include:**

- Steady-state and extended period analysis, with cost of pumping and complex logical controls
- Age of water and propagation of multiple substances
- Pressure-dependent demand
- Dynamic forward and backward tracing
- Fire flow analysis
- Importing and exporting of EPANET models
- Electric rate structures for accurate modelling of electric power contracts for pump stations
- Variable fluid properties to include non-potable liquids
Synergi Water extended capabilities:

The Pipeline Flushing module allows engineers to design optimal unidirectional flushing programs for ongoing maintenance of water distribution systems. This module determines a list of flushing sequences that meet various velocity and shear stress criteria. It also determines an optimal order in which the flushing sequences should be run to minimize the risk of customers receiving discoloured water. A field book of flushing sequences can be generated to guide the flushing crew.

The Reliability module allows engineers to do a criticality analysis of pipes in the distribution system under different pipe failure scenarios. This can be used to prioritize mains replacement or rehabilitation program. This module can be used together with pressure-dependent demands to accurately assess the impact of pipe failures.

The Area Isolation module allows engineers and operators to model the effects of isolating parts of a water distribution system for emergency planning. This module assesses the impact of area isolation on pressures and flows in the distribution system and can generate a list of customers impacted.

The Pipe Design module helps engineers determine the most cost-effective way to size pipes while meeting minimum and maximum pressure and velocity criteria. This module can be used to choose between various replacement and rehabilitation methods such as pipe-bursting, slip-lining, cleaning/grouting and cured-in-place.

The Calibration module can be used to do a sensitivity analysis to assess the impact of various model parameters on pressures and flows in a water distribution system. It can also be used to calibrate the model parameters to minimize the difference between measured and calculated values of pressures and flows.

The Pump Scheduling Optimization module helps engineers and operators determine the most cost-effective way of operating pump stations while meeting operational demands. This module can determine optimal combinations of pumps to run. It can also take into account complex electric power contracts in order to determine the optimal running schedule for various pumps.

The Customer Management module provides a link between Synergi Water and your customer information systems (CIS). It allows engineers to associate customers with pipes in a model and generate nodal demands for hydraulic and water quality analyses.

The Subsystem Management module allows engineers to extract portions of a model and to merge smaller models together. This module can also be used to skeletonize models, which reduces model complexity to avoid spending modelling time and resources on non-critical model features.

Model Builder links your Geospatial Information System to Synergi Water and provides a direct link to import data from your asset management database. This saves time, money and improves the efficiency of your engineering process while leveraging your investment in GIS technology. Models built from GIS set the foundation to publish Synergi Water results back to the GIS.
About DNV GL

DNV GL is a global quality assurance and risk management company. Driven by our purpose of safeguarding life, property and the environment, we enable our customers to advance the safety and sustainability of their business. Operating in more than 100 countries, our professionals are dedicated to helping customers in the maritime, oil & gas, power and renewables and other industries to make the world safer, smarter and greener.

Digital Solutions

DNV GL is a world-leading provider of digital solutions for managing risk and improving safety and asset performance for ships, pipelines, processing plants, offshore structures, electric grids, smart cities and more. Our open industry platform Veracity, cyber security and software solutions support business-critical activities across many industries, including maritime, energy and healthcare.